Optically-Coupled Isolator

Optoelectronic Products

H11A1, H11A2 H11A3, H11A4

General Description

The H11A1, H11A2, H11A3 and H11A4 optical isolators are electrical and mechanical replacements for the General Electric series. Optical intercoupling provides a high degree of ac and dc isolation. A capability for continuous operation of the input diode results in a frequency response extending to dc. Connection to the base is also provided for design flexibility.

Glassolated™
Electrically Equivalent to GE Devices
Pin-for-Pin Equivalent to GE Devices
Availability of Base Pin for Flexible Design

Absolute Maximum Ratings

Maximum Temperature and Humidity

Storage Temperature	−55°C to +150°C
Operating Temperature	−55°C to +100°C
Pin Temperature (Soldering, 5 s)	260°C
Total Package Power Dissipation at T_A = 25°C,	
LED plus Detector	250 mW
Derate Linearly from 25°C	3.3 mW/°C

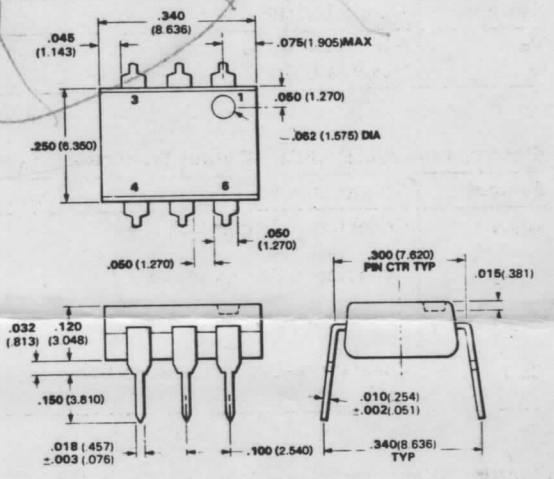
Input Diode

V_R	Reverse Voltage	3.0 V
I_F	Forward dc Current	60 mA
I_{pk}	Peak Forward Current at 1 μs pulse width, 300 pps	3.0 A
P_D	Power Dissipation at T_A = 25°C	100 mW/°C
	Derate Linearly from 25°C	1.33 mW/°C

Output Transistor

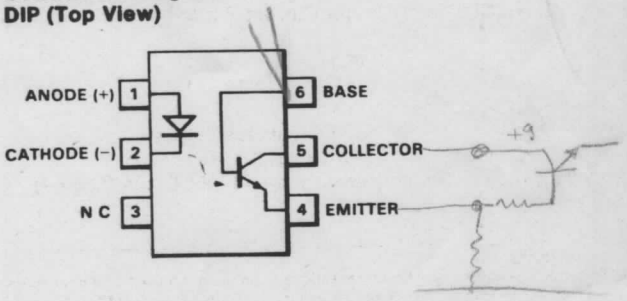
V_{CE}	Collector-to-Emitter Voltage	30 V
V_{CB}	Collector-to-Base Voltage	70 V
I_C	Collector Current	100 mA
P_D	Power Dissipation at T_A = 25°C	150 mW
	Derate Linearly from 25°C	2.0 mW/°C

Package Outline

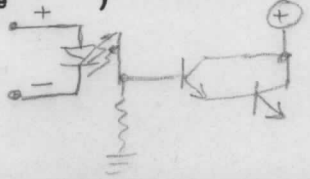


Notes
All dimensions in inches **bold** and millimeters (parentheses)
Tolerance unless specified = ±.015 (±.381)

Connection Diagram
DIP (Top View)



Pin		
1	Anode (+)	Input Diode
2	Cathode (−)	
3	NC	
4	Emitter	Output npn Phototransistor
5	Collector	
6	Base	



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Typical Electrical Characteristics

H11A1, H11A2 H11A3, H11A4

Electrical Characteristics—Input Diode $T_A = 25°C$

Symbol	Characteristic	Min	Typ	Max	Units	Test Conditions
V_F	Forward Voltage		1.1	1.5	V	$I_F = 10$ mA
I_R	Reverse Current			10	μA	$V_R = 3.0$ V

Electrical Characteristics—Output Transistor $T_A = 25°C$

Symbol	Characteristic	Min	Typ	Max	Units	Test Conditions
V_{CEO}	Collector-to-Emitter Voltage	30			V	$I_C = 10$ mA, $I_F = 0$
V_{CBO}	Collector-to-Base Voltage	70			V	$I_C = 100$ μA, $I_F = 0$
V_{ECO}	Emitter-to-Collector Voltage	7.0			V	$I_E = 100$ μA, $I_F = 0$
I_{CEO}	Collector-to-Emitter Leakage Current		5.0	50	nA	$V_{CE} = 10$ V, $I_F = 0$

Electrical Characteristics—Coupled $T_A = 25°C$

Symbol	Characteristic	Min	Typ	Max	Units	Test Conditions
V_{ISO}	Isolation Voltage (Note 3)					
	H11A1, H11A3	2500			V	Peak
	H11A2, H11A4	1500			V	Peak
$V_{CE(sat)}$	Collector-to-Emitter Saturation Voltage		0.1	0.4	V	$I_C = 0.5$ mA, $I_F = 50$ mA
I_C/I_F(CTR)	Collector Current Transfer Ratio (Note 1)					$V_{CE} = 10$ V, $I_F = 10$ mA
	H11A1	50			%	
	H11A2, H11A3	20			%	
	H11A4	10			%	
R_{IO}	Input-to-Output Resistance	10^{11}			Ω	$V_{IO} = 500$ V
C_{IO}	Input-to-Output Capacitance		2.0		pF	$f = 1.0$ MHz
t_r, t_f	Collector Rise and Fall Times (Note 2)		2.0		μs	$I_C = 2.0$ mA, $V_{CE} = 10$ V, $R_L = 100$ Ω

Notes

1. Collector current transfer ratio is defined as the ratio of the collector current to the forward bias input current.
2. Rise time is defined as the time for the collector current to rise from 10% to 90% of peak value. Fall time is defined as the time required for the current to decrease from 90% to 10% of peak value.
3. Isolation voltage defined as minimum of 5 s continuous application.

Optically-C Darlington

Optoelectronic Produc

General Desription

The H11B1 and H11B2 and mechanical replac series. Optical interco ac and dc isolation. A operation of the input response extending to also provided for desi

Glassolated™
Electrically Equivalen
Pin-For-Pin Equivalen
Availability of Base P

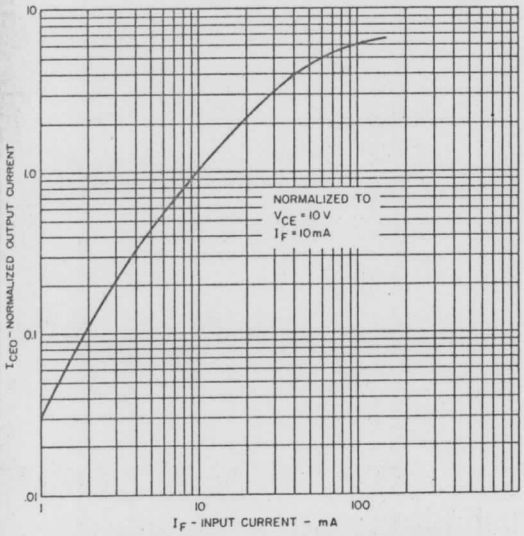
Absolute Maximum R

Maximum Temperatu
Storage Temperature
Operating Temperatur
Pin Temperature (Sold
Total Package Power
at T_A=25°C
LED plus Detector
Derate Linearly from 2

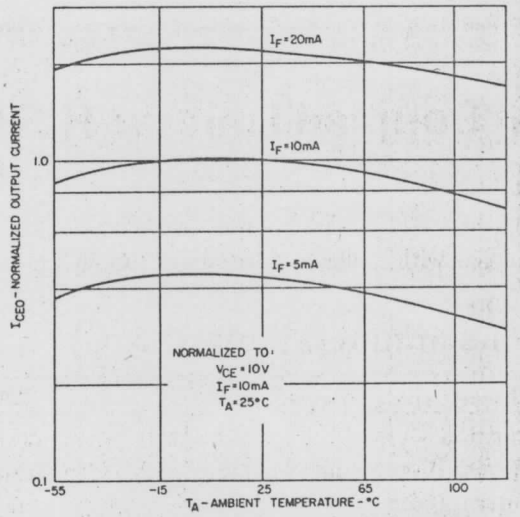
Input Diode
I_F Forward dc Curr Continuous
V_R Reverse Voltage
I_{pk} Peak Forward C (1μs pulse width
P_D Power Dissipatio $T_A = 25°C$
Derate Linearly

Output Transistor (Da
V_{CE} Collector to Emit Voltage
V_{CB} Collector-to-Bas
V_{EC} Emitter-to-Collec Voltage
P_D Power Dissipatio at $T_A = 25°C$, I_C (max) = 100 $V_{CE} = 1.5$ V
Derate Linearly

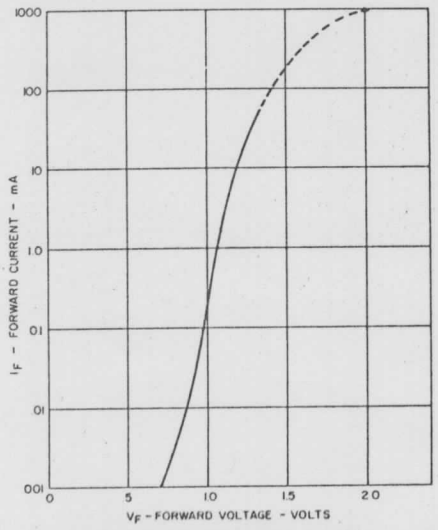
TYPICAL CHARACTERISTICS



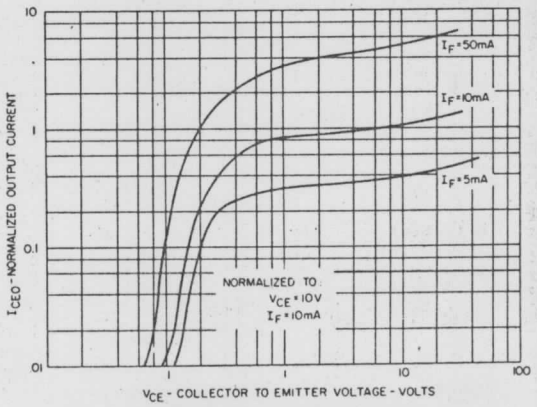
OUTPUT CURRENT VS INPUT CURRENT



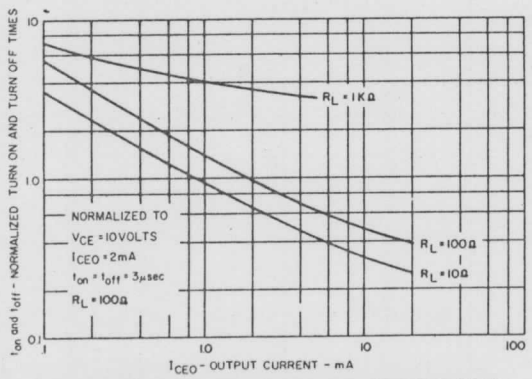
OUTPUT CURRENT VS TEMPERATURE



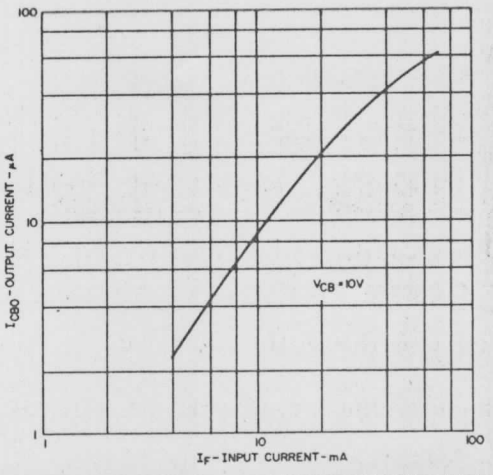
INPUT CHARACTERISTICS



OUTPUT CHARACTERISTICS



SWITCHING TIMES VS OUTPUT CURRENT



OUTPUT CURRENT (I_{CBO}) VS INPUT CURRENT